September 2004 Water Sampling

Validation Data Package for Interim Action Configuration 2 Shallow Well Shutdown and Full Scale Startup Moab, Utah

December 2004

MOAB, UTAH

September 22-23, 2004

DATA PACKAGE CONTENTS

This data package includes the following information:

Item No.	Description of Contents
1.	**Site Hydrologist Summary**
2.	**Data Assessment Summary,** which describes problems identified in the data validation process and summarizes the validator's findings.
3.	**Sampling Location Map**
4.	**Field Activities Verification Checklist**, which verifies that field activities were done according to the work plan.
5.	**Database Printouts.** a. Water Quality Data b. Water Level Data
6.	**Sampling Trip Report**

Site Hydrologist Summary

Site: Moab, Utah

Sampling Period: September 22-23, 2004

The purpose of this sampling was to collect data as part of an extraction test being conducted to evaluate the startup performance of the new configuration 2 well field. Configuration 2 well field consists of five deep extraction wells and five shallow extraction wells. The shallow wells were in operation for approximately 1 week prior to sampling. After the samples were collected the five deep extraction wells were started. The five shallow extraction wells also continued to operate.

Sampling and analysis was conducted in accordance with the *Operations, Maintenance, and Performance Monitoring Plan for the Interim Action Ground Water Treatment System, February 2004.* Ground water samples were collected from five shallow extraction wells (0570, 0572, 0574, 0576, and 0578), seven observation wells (0581 – 0587), and four piezometers (0590 – 0593).

Analysis and interpretation of the validated data presented in this package will be reported as part of a performance evaluation report scheduled to be prepared in 2005.

Ken Karp
Site Lead

12-9-04
Date

DATA ASSESSMENT SUMMARY

MOAB, UTAH
SEPTEMBER 22-23, 2004 SAMPLING EVENT
DATA ASSESSMENT SUMMARY

Paragon Analytics analyzed samples and reported results for this sampling event under requisition number 04080112 and work order number 0409201. All analyses were successfully completed. Samples were prepared and analyzed using accepted procedures based on methods specified by line item code as listed in Table 1.

Table 1. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Uranium, U	GJO-01	SW-846 3005A	SW-846 6020
Chloride, Cl	MIS-A-039	SW-846 9056	SW-846 9056
Sulfate, SO4	MIS-A-044	SW-846 9056	SW-846 9056
Ammonia as N, NH3-N	WCH-A-005	MCAWW 350.1	MCAWW 350.1
Total Dissolved Solids, TDS	WCH-A-033	MCAWW 160.1	MCAWW 160.1

Data Qualifier Summary

None of the sample results required qualification.

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado received seventeen samples on September 24, 2004, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples are listed on the form and that signatures and dates are present indicating sample relinquishment and receipt. The sample submittal documents including the COC form, the sample submittal form, and the samples tickets, had no errors or omissions.

Holding Times and Preservation

The sample shipment container was received intact with an internal temperature of 2.4° C, which is in compliance with sample preservation requirements. All samples had been preserved correctly for the requested analyses. The metals aliquots from locations 0570, 0591, and 0584 were received with pH values of 3.0, 2.2, and 2.2 respectively. The pH of these aliquots were adjusted to 1.9 with nitric acid and allowed to equilibrate. All samples were analyzed within the applicable holding times.

Laboratory Instrument Calibration

All laboratory instrument calibrations were performed correctly in accordance with the cited methods. Calibrations for uranium were performed on October 4, 2004. The initial calibration was performed using 4 calibration standards resulting in correlation coefficient (r^2) values greater than 0.995. The absolute value of the intercept was less than 3 times the method detection limit (MDL). Calibration and laboratory spike standards were prepared from independent sources.

Initial and continuing calibration verification (CCV) checks were made at the required frequency resulting in 8 CCVs. All calibration checks met the acceptance criteria. A reporting limit verification check was made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit. The reporting limit verification check result was within the acceptance criteria. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries where stable and within acceptance ranges.

Calibrations were performed for chloride and sulfate using 5 calibration standards on September 27, 2004. The r^2 values were greater than 0.995 and intercepts less than 3 times the MDL. Initial calibration and calibration check standards were prepared from independent sources. Initial and continuing calibration checks were made at the required frequency resulting in 4 CCVs that met the acceptance criteria.

The initial calibration for ammonia as N was performed using 6 calibration standards on September 30, 2004, resulting in an r^2 value greater than 0.995. Initial and continuing calibration checks were made at the required frequency resulting in 4 CCVs and all initial and continuing calibration verifications were within the acceptance criteria.

Method and Calibration Blanks

The chloride, sulfate, and ammonia as N method blanks and initial and continuing calibration blanks were below the practical quantitation limits. The method blank for total dissolved solids was below the method detection limit.

Inductively Coupled Plasma (ICP) Interference Check Sample (ICS) Analysis

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency and all results meet the acceptance criteria.

Matrix Spike Analysis

A matrix spike and matrix spike duplicate (MS/MSD) pair for uranium from this requisition was not analyzed. See requisition 04090101 for uranium matrix spike data for this analytical batch. MS/MSD pairs were analyzed for chloride and sulfate with acceptable results.

Laboratory Replicate Analysis

See requisition 04090101 for uranium replicate data for this analytical batch. The relative percent difference values for the matrix spike duplicate and laboratory duplicate sample results for chloride, sulfate, ammonia as N, and total dissolved solids were less than 20 percent.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency with acceptable results for all analysis categories.

Metals Serial Dilution

Serial dilutions were performed during the uranium analysis with acceptable results.

Detection Limits/Dilutions

Samples were diluted is a consistent and acceptable manner when required. The samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved whenever possible.

Completeness

Results were reported in correct units for all analytes requested. Appropriate contract-required laboratory qualifiers were used. Appropriate target analyte lists (TALs) were used, and the required detection limits were met when possible or an explanation of why they were not met was given in the laboratory case narrative. The analytical report did not include the initial calibration data for chloride or sulfate. The laboratory was requested to provide these data on October 14, 2004. The missing data were received October 20, 2004.

Chromatography Peak Integration

The integration of analytes peaks was reviewed for all ion chromatography data. The manual integrations that were performed were acceptable and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

An EDD file arrived on October 13, 2004. The EDD validation application identified no problems with the EDD file.

Field Activities

All monitoring well results were qualified with an "F" flag in the database indicating the wells were purged and sampled using the low-flow sampling method. Extraction wells are not sampled using the low-flow sampling method.

One duplicate sample was collected from well 0576. There are no established regulatory criteria for the evaluation of field duplicate samples; therefore, EPA guidance for laboratory duplicates (which is conservative for field duplicates) was used to assess the precision of the field duplicates. Duplicate results met the laboratory duplicate criteria of +/- 20 relative percent difference and are considered acceptable.

Summary

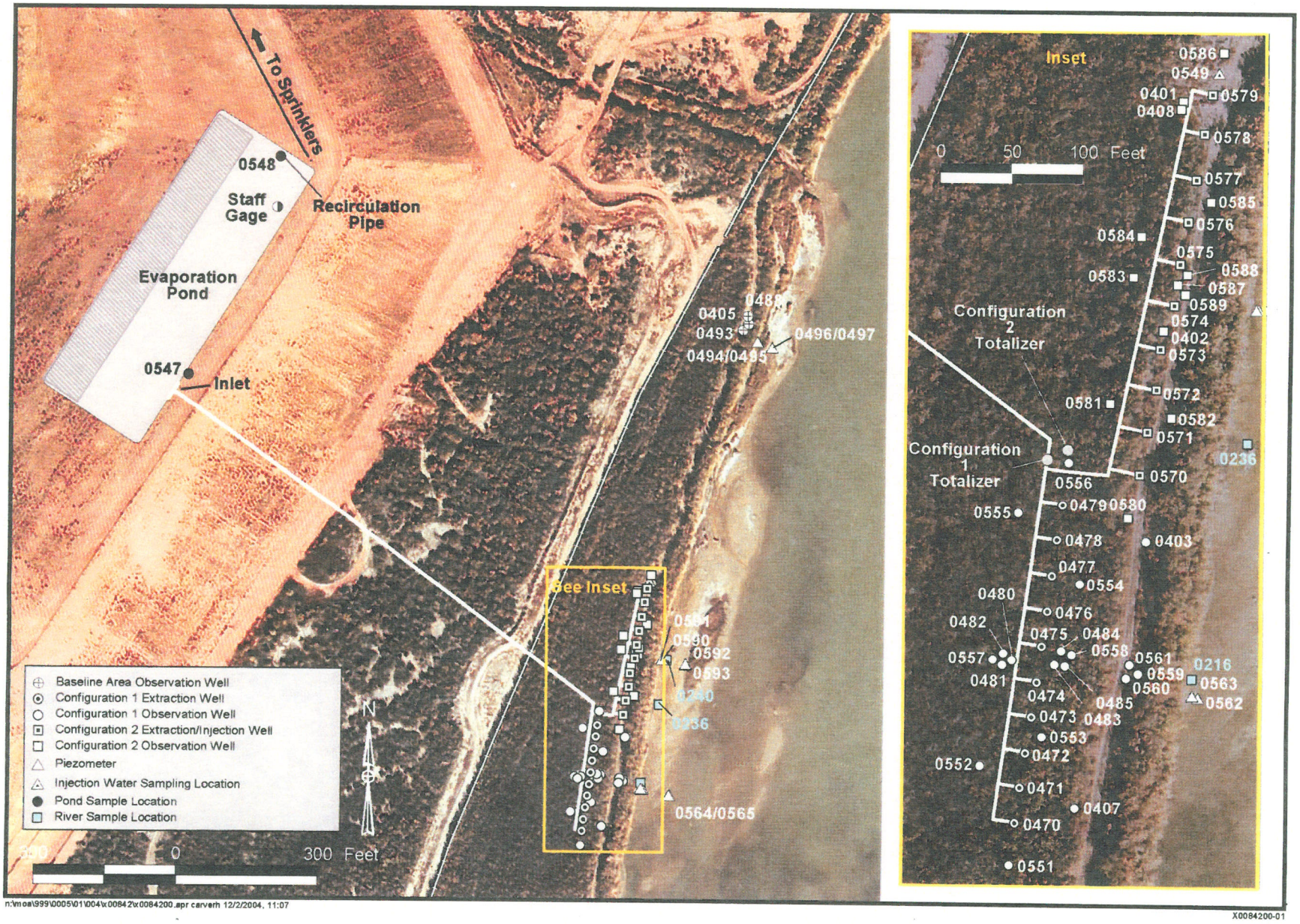
Results were reported in correct units for all analytes requested, appropriate contract-required laboratory qualifiers and target analyte lists (TALs) were used, and the required detection limits

were met when possible or an explanation of why they were not met was given in the laboratory case narrative. All analytical quality control criteria were met except as qualified on the Ground Water Quality Data by Parameter, Surface Water Quality by Parameter, or equipment/trip blank database printouts. The meaning of data qualifiers is defined on the database printouts or defined in the U.S., Environmental Protection Agency Contract Laboratory Program Statement of Work for Inorganic Analysis, Multi-Media Multi-Concentration, Document Number ILMO2.0, 1991. All data in this package are considered validated and may be treated as final results.

Laboratory Validation Lead: Steve Donivan — Steve Donivan — 12-7-04 — Date

Field Activities Validation Lead: for Jeff Price — Jeff Price — 12/3/04 — Date

SAMPLING LOCATION MAP



Sample Locations at the Interim Action Well Field and Baseline Area (may include locations not sampled)

FIELD VERIFICATION CHECKLIST

Water Sampling Field Activities Verification Checklist

Project	Moab, Utah	Date(s) of Water Sampling	September 22-23, 2004
Date(s) of Verification	11/09/04	Name of Verifier	Jeff Price

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOP's, instructions.	NA	
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above named documents?	Yes	
4. Was an operational check of the field equipment conducted twice daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the Category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4 hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	NA	
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	No	Project management decided not collect this sample.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

WATER QUALITY DATA

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Alkalinity, Total (As CaCO3	mg/L	0570	WL, I&E	09/22/2004	0001	15.00 - 30.00	552			#	-	-
	mg/L	0572	WL, I&E	09/22/2004	0001	15.00 - 30.00	647			#	-	-
	mg/L	0574	WL, I&E	09/22/2004	0001	15.00 - 30.00	670			#	-	-
	mg/L	0576	WL, I&E	09/22/2004	0001	15.00 - 30.00	818			#	-	-
	mg/L	0578	WL, I&E	09/22/2004	0001	15.00 - 30.00	828			#	-	-
	mg/L	0581	WL	09/23/2004	0001	18.00 - 18.00	958		F	#	-	-
	mg/L	0582	WL	09/23/2004	0001	18.00 - 18.00	812		F	#	-	-
	mg/L	0583	WL	09/23/2004	0001	18.00 - 18.00	994		F	#	-	-
	mg/L	0584	WL	09/23/2004	0001	18.00 - 18.00	920		F	#	-	-
	mg/L	0585	WL	09/23/2004	0001	18.00 - 18.00	880		F	#	-	-
	mg/L	0586	WL	09/23/2004	0001	18.00 - 18.00	890		F	#	-	-
	mg/L	0587	WL	09/23/2004	0001	18.00 - 18.00	860		F	#	-	-
	mg/L	0593	WL, PZ	09/22/2004	0001	4.13 - 4.13	995		F	#	-	-
Ammonia Total as N	mg/L	0570	WL, I&E	09/22/2004	0001	15.00 - 30.00	1500			#	50	-
	mg/L	0572	WL, I&E	09/22/2004	0001	15.00 - 30.00	1100			#	50	-
	mg/L	0574	WL, I&E	09/22/2004	0001	15.00 - 30.00	960			#	50	-
	mg/L	0576	WL, I&E	09/22/2004	0001	15.00 - 30.00	930			#	50	-
	mg/L	0576	WL, I&E	09/22/2004	0002	15.00 - 30.00	980			#	50	-
	mg/L	0578	WL, I&E	09/22/2004	0001	15.00 - 30.00	700			#	50	-
	mg/L	0581	WL	09/23/2004	0001	18.00 - 18.00	600		F	#	50	-
	mg/L	0582	WL	09/23/2004	0001	18.00 - 18.00	540		F	#	50	-
	mg/L	0583	WL	09/23/2004	0001	18.00 - 18.00	580		F	#	50	-
	mg/L	0584	WL	09/23/2004	0001	18.00 - 18.00	630		F	#	50	-
	mg/L	0585	WL	09/23/2004	0001	18.00 - 18.00	500		F	#	50	-
	mg/L	0586	WL	09/23/2004	0001	18.00 - 18.00	470		F	#	50	-
	mg/L	0587	WL	09/23/2004	0001	18.00 - 18.00	530		F	#	50	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	0590	WL, PZ	09/22/2004	0001	1.08 - 1.08	230		F	#	50	-
	mg/L	0591	WL, PZ	09/22/2004	0001	4.22 - 4.22	860		F	#	50	-
	mg/L	0592	WL, PZ	09/22/2004	0001	2.10 - 2.10	470		F	#	50	-
	mg/L	0593	WL, PZ	09/22/2004	0001	4.13 - 4.13	740		F	#	50	-
Chloride	mg/L	0570	WL, I&E	09/22/2004	0001	15.00 - 30.00	23000			#	400	-
	mg/L	0572	WL, I&E	09/22/2004	0001	15.00 - 30.00	17000			#	200	-
	mg/L	0574	WL, I&E	09/22/2004	0001	15.00 - 30.00	14000			#	200	-
	mg/L	0576	WL, I&E	09/22/2004	0001	15.00 - 30.00	9500			#	100	-
	mg/L	0576	WL, I&E	09/22/2004	0002	15.00 - 30.00	11000			#	200	-
	mg/L	0578	WL, I&E	09/22/2004	0001	15.00 - 30.00	4200			#	100	-
	mg/L	0581	WL	09/23/2004	0001	18.00 - 18.00	2200		F	#	40	-
	mg/L	0582	WL	09/23/2004	0001	18.00 - 18.00	2200		F	#	40	-
	mg/L	0583	WL	09/23/2004	0001	18.00 - 18.00	1800		F	#	40	-
	mg/L	0584	WL	09/23/2004	0001	18.00 - 18.00	1900		F	#	40	-
	mg/L	0585	WL	09/23/2004	0001	18.00 - 18.00	1800		F	#	40	-
	mg/L	0586	WL	09/23/2004	0001	18.00 - 18.00	1800		F	#	40	-
	mg/L	0587	WL	09/23/2004	0001	18.00 - 18.00	1900		F	#	40	-
	mg/L	0590	WL, PZ	09/22/2004	0001	1.08 - 1.08	2000		F	#	40	-
	mg/L	0591	WL, PZ	09/22/2004	0001	4.22 - 4.22	3200		F	#	100	-
	mg/L	0592	WL, PZ	09/22/2004	0001	2.10 - 2.10	1500		F	#	40	-
	mg/L	0593	WL, PZ	09/22/2004	0001	4.13 - 4.13	2900		F	#	100	-
Oxidation Reduction Potent	mV	0570	WL, I&E	09/22/2004	N001	15.00 - 30.00	172.1			#	-	-
	mV	0572	WL, I&E	09/22/2004	N001	15.00 - 30.00	155.8			#	-	-
	mV	0574	WL, I&E	09/22/2004	N001	15.00 - 30.00	87.4			#	-	-
	mV	0576	WL, I&E	09/22/2004	N001	15.00 - 30.00	65.1			#	-	-
	mV	0578	WL, I&E	09/22/2004	N001	15.00 - 30.00	97.0			#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potent	mV	0581	WL	09/23/2004	N001	18.00 - 18.00	235.3		F	#	-	-
	mV	0582	WL	09/23/2004	N001	18.00 - 18.00	205.7		F	#	-	-
	mV	0583	WL	09/23/2004	N001	18.00 - 18.00	186.9		F	#	-	-
	mV	0584	WL	09/23/2004	N001	18.00 - 18.00	170.3		F	#	-	-
	mV	0585	WL	09/23/2004	N001	18.00 - 18.00	156.2		F	#	-	-
	mV	0586	WL	09/23/2004	N001	18.00 - 18.00	154.2		F	#	-	-
	mV	0587	WL	09/23/2004	N001	18.00 - 18.00	163.6		F	#	-	-
	mV	0590	WL, PZ	09/22/2004	N001	1.08 - 1.08	69.6		F	#	-	-
	mV	0591	WL, PZ	09/22/2004	N001	4.22 - 4.22	15.1		F	#	-	-
	mV	0592	WL, PZ	09/22/2004	N001	2.10 - 2.10	36.8		F	#	-	-
	mV	0593	WL, PZ	09/22/2004	N001	4.13 - 4.13	55.5		F	#	-	-
pH	s.u.	0570	WL, I&E	09/22/2004	N001	15.00 - 30.00	6.74			#	-	-
	s.u.	0572	WL, I&E	09/22/2004	N001	15.00 - 30.00	6.81			#	-	-
	s.u.	0574	WL, I&E	09/22/2004	N001	15.00 - 30.00	7.31			#	-	-
	s.u.	0576	WL, I&E	09/22/2004	N001	15.00 - 30.00	6.87			#	-	-
	s.u.	0578	WL, I&E	09/22/2004	N001	15.00 - 30.00	6.90			#	-	-
	s.u.	0581	WL	09/23/2004	N001	18.00 - 18.00	6.84		F	#	-	-
	s.u.	0582	WL	09/23/2004	N001	18.00 - 18.00	6.82		F	#	-	-
	s.u.	0583	WL	09/23/2004	N001	18.00 - 18.00	6.82		F	#	-	-
	s.u.	0584	WL	09/23/2004	N001	18.00 - 18.00	6.84		F	#	-	-
	s.u.	0585	WL	09/23/2004	N001	18.00 - 18.00	6.84		F	#	-	-
	s.u.	0586	WL	09/23/2004	N001	18.00 - 18.00	6.83		F	#	-	-
	s.u.	0587	WL	09/23/2004	N001	18.00 - 18.00	6.83		F	#	-	-
	s.u.	0590	WL, PZ	09/22/2004	N001	1.08 - 1.08	7.95		F	#	-	-
	s.u.	0591	WL, PZ	09/22/2004	N001	4.22 - 4.22	8.56		F	#	-	-
	s.u.	0592	WL, PZ	09/22/2004	N001	2.10 - 2.10	7.52		F	#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
pH	s.u.	0593	WL, PZ	09/22/2004	N001	4.13 - 4.13	7.08		F	#	-	-
Specific Conductance	umhos/cm	0570	WL, I&E	09/22/2004	N001	15.00 - 30.00	49034			#	-	-
	umhos/cm	0572	WL, I&E	09/22/2004	N001	15.00 - 30.00	40839			#	-	-
	umhos/cm	0574	WL, I&E	09/22/2004	N001	15.00 - 30.00	38370			#	-	-
	umhos/cm	0576	WL, I&E	09/22/2004	N001	15.00 - 30.00	30325			#	-	-
	umhos/cm	0578	WL, I&E	09/22/2004	N001	15.00 - 30.00	21018			#	-	-
	umhos/cm	0581	WL	09/23/2004	N001	18.00 - 18.00	14744		F	#	-	-
	umhos/cm	0582	WL	09/23/2004	N001	18.00 - 18.00	14832		F	#	-	-
	umhos/cm	0583	WL	09/23/2004	N001	18.00 - 18.00	13728		F	#	-	-
	umhos/cm	0584	WL	09/23/2004	N001	18.00 - 18.00	14224		F	#	-	-
	umhos/cm	0585	WL	09/23/2004	N001	18.00 - 18.00	13722		F	#	-	-
	umhos/cm	0586	WL	09/23/2004	N001	18.00 - 18.00	13374		F	#	-	-
	umhos/cm	0587	WL	09/23/2004	N001	18.00 - 18.00	13997		F	#	-	-
	umhos/cm	0590	WL, PZ	09/22/2004	N001	1.08 - 1.08	15063		F	#	-	-
	umhos/cm	0591	WL, PZ	09/22/2004	N001	4.22 - 4.22	22372		F	#	-	-
	umhos/cm	0592	WL, PZ	09/22/2004	N001	2.10 - 2.10	18379		F	#	-	-
	umhos/cm	0593	WL, PZ	09/22/2004	N001	4.13 - 4.13	20530		F	#	-	-
Sulfate	mg/L	0570	WL, I&E	09/22/2004	0001	15.00 - 30.00	9000			#	500	-
	mg/L	0572	WL, I&E	09/22/2004	0001	15.00 - 30.00	8200			#	500	-
	mg/L	0574	WL, I&E	09/22/2004	0001	15.00 - 30.00	9100			#	250	-
	mg/L	0576	WL, I&E	09/22/2004	0001	15.00 - 30.00	10000			#	250	-
	mg/L	0576	WL, I&E	09/22/2004	0002	15.00 - 30.00	10000			#	250	-
	mg/L	0578	WL, I&E	09/22/2004	0001	15.00 - 30.00	9100			#	250	-
	mg/L	0581	WL	09/23/2004	0001	18.00 - 18.00	7900		F	#	100	-
	mg/L	0582	WL	09/23/2004	0001	18.00 - 18.00	8100		F	#	100	-
	mg/L	0583	WL	09/23/2004	0001	18.00 - 18.00	7900		F	#	100	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Sulfate	mg/L	0584	WL	09/23/2004	0001	18.00 - 18.00	8100		F	#	100	-
	mg/L	0585	WL	09/23/2004	0001	18.00 - 18.00	7700		F	#	100	-
	mg/L	0586	WL	09/23/2004	0001	18.00 - 18.00	7600		F	#	100	-
	mg/L	0587	WL	09/23/2004	0001	18.00 - 18.00	8000		F	#	100	-
	mg/L	0590	WL, PZ	09/22/2004	0001	1.08 - 1.08	5300		F	#	100	-
	mg/L	0591	WL, PZ	09/22/2004	0001	4.22 - 4.22	13000		F	#	250	-
	mg/L	0592	WL, PZ	09/22/2004	0001	2.10 - 2.10	5000		F	#	100	-
	mg/L	0593	WL, PZ	09/22/2004	0001	4.13 - 4.13	10000		F	#	250	-
Temperature	C	0570	WL, I&E	09/22/2004	N001	15.00 - 30.00	18.55			#	-	-
	C	0572	WL, I&E	09/22/2004	N001	15.00 - 30.00	17.99			#	-	-
	C	0574	WL, I&E	09/22/2004	N001	15.00 - 30.00	17.34			#	-	-
	C	0576	WL, I&E	09/22/2004	N001	15.00 - 30.00	18.76			#	-	-
	C	0578	WL, I&E	09/22/2004	N001	15.00 - 30.00	17.73			#	-	-
	C	0581	WL	09/23/2004	N001	18.00 - 18.00	15.97		F	#	-	-
	C	0582	WL	09/23/2004	N001	18.00 - 18.00	15.91		F	#	-	-
	C	0583	WL	09/23/2004	N001	18.00 - 18.00	16.35		F	#	-	-
	C	0584	WL	09/23/2004	N001	18.00 - 18.00	16.73		F	#	-	-
	C	0585	WL	09/23/2004	N001	18.00 - 18.00	17.00		F	#	-	-
	C	0586	WL	09/23/2004	N001	18.00 - 18.00	17.11		F	#	-	-
	C	0587	WL	09/23/2004	N001	18.00 - 18.00	17.59		F	#	-	-
	C	0590	WL, PZ	09/22/2004	N001	1.08 - 1.08	17.12		F	#	-	-
	C	0591	WL, PZ	09/22/2004	N001	4.22 - 4.22	18.64		F	#	-	-
	C	0592	WL, PZ	09/22/2004	N001	2.10 - 2.10	19.35		F	#	-	-
	C	0593	WL, PZ	09/22/2004	N001	4.13 - 4.13	18.38		F	#	-	-
Total Dissolved Solids	mg/L	0570	WL, I&E	09/22/2004	0001	15.00 - 30.00	44000			#	1000	-
	mg/L	0572	WL, I&E	09/22/2004	0001	15.00 - 30.00	38000			#	1000	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Total Dissolved Solids	mg/L	0574	WL, I&E	09/22/2004	0001	15.00 - 30.00	34000			#	1000	-
	mg/L	0576	WL, I&E	09/22/2004	0001	15.00 - 30.00	31000			#	1000	-
	mg/L	0576	WL, I&E	09/22/2004	0002	15.00 - 30.00	30000			#	1000	-
	mg/L	0578	WL, I&E	09/22/2004	0001	15.00 - 30.00	21000			#	400	-
	mg/L	0581	WL	09/23/2004	0001	18.00 - 18.00	15000		F	#	400	-
	mg/L	0582	WL	09/23/2004	0001	18.00 - 18.00	15000		F	#	400	-
	mg/L	0583	WL	09/23/2004	0001	18.00 - 18.00	14000		F	#	400	-
	mg/L	0584	WL	09/23/2004	0001	18.00 - 18.00	15000		F	#	400	-
	mg/L	0585	WL	09/23/2004	0001	18.00 - 18.00	14000		F	#	400	-
	mg/L	0586	WL	09/23/2004	0001	18.00 - 18.00	14000		F	#	400	-
	mg/L	0587	WL	09/23/2004	0001	18.00 - 18.00	14000		F	#	400	-
	mg/L	0590	WL, PZ	09/22/2004	0001	1.08 - 1.08	11000		F	#	400	-
	mg/L	0591	WL, PZ	09/22/2004	0001	4.22 - 4.22	22000		F	#	1000	-
	mg/L	0592	WL, PZ	09/22/2004	0001	2.10 - 2.10	6300		F	#	400	-
	mg/L	0593	WL, PZ	09/22/2004	0001	4.13 - 4.13	20000		F	#	400	-
Turbidity	NTU	0570	WL, I&E	09/22/2004	N001	15.00 - 30.00	1.71			#	-	-
	NTU	0572	WL, I&E	09/22/2004	N001	15.00 - 30.00	3.45			#	-	-
	NTU	0574	WL, I&E	09/22/2004	N001	15.00 - 30.00	5.28			#	-	-
	NTU	0576	WL, I&E	09/22/2004	N001	15.00 - 30.00	16.7			#	-	-
	NTU	0578	WL, I&E	09/22/2004	N001	15.00 - 30.00	3.01			#	-	-
	NTU	0581	WL	09/23/2004	N001	18.00 - 18.00	10.7		F	#	-	-
	NTU	0582	WL	09/23/2004	N001	18.00 - 18.00	15.4		F	#	-	-
	NTU	0583	WL	09/23/2004	N001	18.00 - 18.00	20.9		F	#	-	-
	NTU	0584	WL	09/23/2004	N001	18.00 - 18.00	19.6		F	#	-	-
	NTU	0585	WL	09/23/2004	N001	18.00 - 18.00	5.83		F	#	-	-
	NTU	0586	WL	09/23/2004	N001	18.00 - 18.00	53.5		F	#	-	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Turbidity	NTU	0587	WL	09/23/2004	N001	18.00 - 18.00	29.6		F	#	-	-
	NTU	0590	WL, PZ	09/22/2004	N001	1.08 - 1.08	1000	U	F	#	1000	-
	NTU	0591	WL, PZ	09/22/2004	N001	4.22 - 4.22	1000	U	F	#	1000	-
	NTU	0592	WL, PZ	09/22/2004	N001	2.10 - 2.10	1000	U	F	#	1000	-
	NTU	0593	WL, PZ	09/22/2004	N001	4.13 - 4.13	80.9		F	#	-	-
Uranium	mg/L	0570	WL, I&E	09/22/2004	0001	15.00 - 30.00	2.100			#	0.0012	-
	mg/L	0572	WL, I&E	09/22/2004	0001	15.00 - 30.00	2.200			#	0.0012	-
	mg/L	0574	WL, I&E	09/22/2004	0001	15.00 - 30.00	2.500			#	0.0012	-
	mg/L	0576	WL, I&E	09/22/2004	0001	15.00 - 30.00	2.700			#	0.0012	-
	mg/L	0576	WL, I&E	09/22/2004	0002	15.00 - 30.00	2.700			#	0.0012	-
	mg/L	0578	WL, I&E	09/22/2004	0001	15.00 - 30.00	2.500			#	0.0012	-
	mg/L	0581	WL	09/23/2004	0001	18.00 - 18.00	2.500		F	#	0.0012	-
	mg/L	0582	WL	09/23/2004	0001	18.00 - 18.00	2.300		F	#	0.0012	-
	mg/L	0583	WL	09/23/2004	0001	18.00 - 18.00	2.400		F	#	0.0012	-
	mg/L	0584	WL	09/23/2004	0001	18.00 - 18.00	2.500		F	#	0.0012	-
	mg/L	0585	WL	09/23/2004	0001	18.00 - 18.00	2.300		F	#	0.0012	-
	mg/L	0586	WL	09/23/2004	0001	18.00 - 18.00	2.200		F	#	0.0012	-
	mg/L	0587	WL	09/23/2004	0001	18.00 - 18.00	2.200		F	#	0.0012	-
	mg/L	0590	WL, PZ	09/22/2004	0001	1.08 - 1.08	1.300		F	#	0.0012	-
	mg/L	0591	WL, PZ	09/22/2004	0001	4.22 - 4.22	1.800		F	#	0.0012	-
	mg/L	0592	WL, PZ	09/22/2004	0001	2.10 - 2.10	0.730		F	#	0.0012	-
	mg/L	0593	WL, PZ	09/22/2004	0001	4.13 - 4.13	2.700		F	#	0.0012	-

GENERAL WATER QUALITY DATA BY PARAMETER (USEE205) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 11/9/2004 4:23 pm

PARAMETER	UNITS	LOCATION ID	LOC TYPE, SUBTYPE	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY

RECORDS: SELECTED FROM USEE200 WHERE site_code='MOA01' AND quality_assurance = TRUE AND (data_validation_qualifiers IS NULL OR data_validation_qualifiers NOT LIKE '%R%' AND data_validation_qualifiers NOT LIKE '%X%') AND DATE_SAMPLED between #9/20/2004# and #9/24/2004#

SAMPLE ID CODES: 000X = Filtered sample (0.45 µm). N00X = Unfiltered sample. X = replicate number.

LOCATION TYPES: WL WELL

LOCATION SUBTYPES: I&E Dual Purpose Injection and Ex PZ Piezometer

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
C	Pesticide result confirmed by GC-MS.
D	Analyte determined in diluted sample.
E	Inorganic: Estimate value because of interference, see case narrative. Organic: Analyte exceeded calibration range of the GC-MS.
H	Holding time expired, value suspect.
I	Increased detection limit due to required dilution.
J	Estimated
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFIERS:

F	Low flow sampling method used.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

WATER LEVELS

STATIC WATER LEVELS (USEE700) FOR SITE MOA01, Moab Disposal Site
REPORT DATE: 12/7/2004 9:33 am

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT		DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
			DATE	TIME			
0570		3965.22	09/22/2004	14:23	25.55	3939.67	
0572		3965.14	09/22/2004	14:37	23.92	3941.22	
0574		3965.12	09/22/2004	14:49	26.52	3938.60	
0576		3965.15	09/22/2004	15:10	22.56	3942.59	
0578		3965.08	09/22/2004	15:30	26.81	3938.27	
0581		3969.02	09/23/2004	09:14	16.75	3952.27	
0582		3969.65	09/23/2004	09:37	17.04	3952.61	
0583		3969.64	09/23/2004	10:06	17.07	3952.57	
0584		3969.13	09/23/2004	10:42	16.37	3952.76	
0585		3969.36	09/23/2004	11:23	16.33	3953.03	
0586		3969.20	09/23/2004	11:42	15.72	3953.48	
0587		3968.89	09/23/2004	11:06	16.02	3952.87	
0590		3956.70	09/22/2004	16:41	3.82	3952.88	
0591		3953.99	09/22/2004	16:51	1.32	3952.67	
0592		3956.36	09/22/2004	17:31	3.10	3953.26	
0593		3954.90	09/22/2004	17:36	1.65	3953.25	

RECORDS: SELECTED FROM USEE700 WHERE site_code='MOA01' AND LOG_DATE between #9/22/2004# and #9/23/2004#

FLOW CODES:

WATER LEVEL FLAGS:

SAMPLING TRIP REPORT

Stoller

established 1959

Grand Junction Office

Memorandum

DATE: October 6, 2004

TO: Ken Karp

FROM: Ken Pill

SUBJECT: Trip Report

Site: Moab – I.A. Extraction Configuration II Shallow Well Test Shutdown and Full Scale Startup Sampling (Revised)

Date of Sampling Event: September 22 and 23, 2004.

Team Members: Ken Pill and Steve Hall.

Number of Locations Sampled: 5 extraction wells (0570, 0572, 0574, 0576, and 0578), 7 observation wells (0581 through 0587) and 4 piezometers (0590 through 0593) were sampled as part of the shallow well test shutdown sampling event. Including one duplicate, a total of 17 samples were collected.

Locations Not Sampled/Reason: None.

RIN Number Assigned: All samples were assigned to RIN 04090112.

Field Variance: Only a 125 ml sample was collected for uranium analysis as opposed to the standard 500 ml sample volume. Approximately 350 milliliters (mls) were collected from piezometer 0590 due to slow recharge at this location.

Quality Control Sample Cross Reference: Following is the false identification assigned to the quality control sample:

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2507	0576	Duplicate	Ground water	NDX-950

Sample Shipment: All samples were shipped (in one cooler) overnight FEDEX to Paragon Analytics, Inc. from Moab, Utah, on September 23, 2004, Airbill No. 809324804068.

Location Specific Information—Shallow Well Test Shutdown: The shallow extraction wells (0570, 0572, 0574, 0576, and 0578) were sampled using dedicated submersible pumps. These wells were sampled within the last two hours of the 198-hour long test. The table below provides the depth to water measurements and pumping rate from each location during the shallow well test just prior to sampling:

Well No.	Date	Time	Depth to Water (ft btoc)	Pumping Rate (gpm)
0570	9/22/04	14:19	25.55	1.85
0572	9/22/04	14:35	23.92	1.85
0574	9/22/04	14:53	26.52	1.30
0576	9/22/04	15:09	22.56	1.26
0578	9/22/04	15:27	26.81	1.49

Location Specific Information—Observation Wells: Each observation well (0581 through 0587) was sampled using the micro-purge technique with a peristaltic pump and downhole tubing. Samples were collected from each well at a depth of 18 feet bgs. The table below provides the depth to water measured from each well just prior to sampling:

Well No.	Date	Time	Depth to Water (ft btoc)
0581	9/23/04	9:19	16.75
0582	9/23/04	9:42	17.04
0583	9/23/04	10:09	17.07
0584	9/23/04	10:46	16.37
0585	9/23/04	11:27	16.33
0586	9/23/04	11:46	15.72
0587	9/23/04	11:09	16.02

Location Specific Information—Piezometers: Each piezometer (0590 through 0593) was sampled using a peristaltic pump and downhole tubing. The table below provides the depth to water measured inside each piezometer:

Well No.	Date	Time	Depth to Water (ft btoc)
590	9/22/04	16:42	3.82
591	9/22/04	16:53	1.32
592	9/22/04	17:35	3.10
593	9/22/04	17:40	1.65

Only piezometer 0593 recharged quickly enough to provide a complete sample during the initial visit (on September 22, 2004) to the location. Additional trips were made the following day (September 23, 2004) to collect the remaining volume required for analysis at locations 0590, 0591, and 0592. Piezometer 0590 recharged so slowly that only approximately 350 mls were collected for analysis. As a result, no chloride or sulfate analyses were conducted on this sample.

Field parameters were measured from the surface water surrounding these piezometers (the Colorado River flow increased just prior to visiting the site, and the surface of the river was just below the top of piezometer 0591). The results are presented below:

Measurement Location	Surface Water Parameters			
	Temp (°C)	Specific Conductance (µS/cm)	pH	ORP
240	16.67	1463	8.22	51.9

Well Inspection Summary: No well inspections were conducted.

Site Issues: According to the USGS Cisco Gaging Station (Station No. 09180500), the mean daily Colorado River Flow on September 22 and September 23, 2004, was 5,760 cfs.

Corrective Action Required/Taken: None.

(KGP/lcg)

cc: J. D. Berwick, DOE-EM (e)
D. R. Metzler, DOE-EM
C. I. Bahrke, Stoller (e)
K. E. Miller, Stoller
L. M. Wright, Stoller (e)
Working File: MOA